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ABSTRACT

If critical thinking is to be seriously considered as a possible vehicle for educational reform, an exploration of relevant theories of reason is required. This paper offers an analytic framework for understanding theories of reason, presents an overview of recent work in empirical psychology that is related to root conceptions of rationality, and examines the work of Jurgen Habermas whose analysis of reason offers a possible resolution to the issues of contextualism raised by contemporary psychological thought. The root conceptions of rationality that have exerted the most influence on theories of reason can be divided into three main types: reason as one of a small number of basic human mental capacities; reason as a developmentally-based function which can be analyzed in terms of logical and ontological categories; and reason as expressed in paradigmatic social and cultural behaviors and analyzed in terms of the context in which reasoning occurs. Recent psychological research reveals a clear trend towards contextualism. Habermas sees reason as deeply embedded in human interest. The views of Piaget and Kohlberg on the development of reasoning ability are also discussed. The paper concludes with a discussion of several deep concerns which must be addressed if critical thinking is to be the basis for educational reform. Seventy-two references are included. (IAH)

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Reason and Critical Thinking

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Introduction

Critical thinking presupposes that thinkers are capable of rational processing and that appropriate critical procedures instantiate normative principles that distinguish them from simple persuasion or more insidious forms of interpersonal control. It is the role of critical thinking theory, whether informal logic or more general theories of argumentation, to elucidate these principles and apply the normative or practical understanding that grows out of such successful theoretical analyses to particular examples. Although there has been a great deal of effort expended in laying bare such normative principles and applying them to cases, very little work has been done to relate critical thinking to an underlying theory of rationality. Analytic clarification of the concept of rationality is especially crucial in light of the advocacy of critical thinking as an educational ideal (Siegel, 1988) and as the basis for substantive recommendations for curriculum reform, including the schooling of young children (Paul, 1984, Lipman et. al., 1980). Such recommendations fly in the face of a long history of viewing the young as either non-rational or not fully rational. Theorists like McPeck (1981) and Goldman (1984) reflect the conservative position that sees critical thinking as inappropriate in education except as an outgrowth of the mature mastery of the intellectual traditions and the special disciplines. Similar attitudes are most apparent with regard to school children, whether in the familiar educational emphasis on "basic skills" or in the increasing demand for the inculcation of socially approved values through didactic moral education. Conservative critiques of progressive educational tendencies are supported by a vision of rationality that has deep roots in philosophical and psychological theory. Despite their diversity, most theories of reason agree in denying full rational competence to the immature. In some theories the categorical nature of rational competence precludes the attribution of full rational agency to young people as a class. In others, more contextualist considerations render critical thinking a possible educational outcome, but place severe requirements on the structures within which such outcomes can occur (Weinstein, 1988). Clearly, if critical thinking is to be seriously considered as a possible vehicle for educational reform, an exploration of the relevant theories of reason is required.

What we will do in the following paper is first offer an analytic framework for understanding theories of reason. This framework will not be argued for, although historical and textual support is readily available. Rather, the analysis should be judged in terms of its ability to clarify the

underlying threads in the mosaic of contemporary theories of reason. If the analysis is adequate, deep rooted ambiguities, reflecting pervasive philosophical tendencies, will be exposed. These threads, hidden and interwoven, must be seen if the lessons of contemporary theories of reason are to be appropriately applied to the focus of our concern: educational reform through critical thinking. Second, we will present an overview of recent work in empirical psychology, tracing the root conceptions of rationality as they appear in contemporary psychological thought. The claim is that empirical research exhibits a clear trend towards a contextual account of reason. This claim challenges the neutrality of critical thinking, especially in the schools. We shall argue that the contemporary account shows reason to be embedded in contexts that are sensitive to the interests and technical perspectives of the individuals responsible for critical thinking education. Thus, critical thinking may not be sufficiently objective to serve as a neutral frame for the evaluation of the range of concerns typically seen as its object. Finally, we will turn to an examination of the work of Habermas whose analysis of reason offers a possible resolution to the issues that contextualism raises. Habermas offers a universalistic account of reason that takes as its starting place reason as embedded in social interests. His synthesis of universalism and contextualism does not, however, resolve the possibility of arbitrariness and social manipulation in educational contexts. Rather, it permits the tensions to be clearly seen. The conclusion will point to deep concerns that must be addressed if critical thinking is to be the basis for educational reform.

Basic Models for the Theory of Reason

The root conceptions of rationality that have exerted the most influence on theories of reason can be divided into three main types. According to the first of these views, reason is seen as one of a small number of basic human mental capacities. Reason is most commonly seen in contrast to the passions and as affording a desirable basis for two types of judgment: theoretic and practical. This model offers some minimal characterization of the modes of rational discourse, with consistency and comprehensiveness explicitly put foward as the mechanisms for evaluating rational adequacy. Characteristically, such a view does little to provide a detailed analysis of normal rational functioning and development. Reason is not constructed; rather, it is

exposed in the course of intellectual maturation. It is given a fundamental human attribute. Classic views of reason that exemplify this model are those of Plato and Freud.

Models of reason of the second type pay careful attention to the rational function and attempt to enumerate the categories that reason manifests at its most fundamental level. The analysis of reason is derived from logic seen as the basic syntactic apparatus supporting rational discourse. In addition, reason is seen as constituted by the most fundamental categories for understanding objective processes: criteria for identity, concepts of causality and of predication. Aristotle and Kant, whatever their other differences, are the classic exemplifications of this view. This model has, in recent times, been reconstructed within a developmental framework as typified by the work of Piaget (1968). Rational competencies are seen as articulated over time in the normal process of development and through the influence of experience as mediated by the interaction of the organism with its environment. Reasoning, therefore, even where not interfered with by pathology, is not available to all individuals at all times. This point is crucial for the distinction between the theories of the second type and those of the first. In a developmentalist perspective, some individuals are, in principle, incapable of reasoning at the highest level. The rational faculties, hierarchically organized, need to be developed through interaction with a sufficiently challenging environment. For the child (or the primitive) no amount of rational instruction can affect the processing of information, since all information is already processed through a more primitive schematism. Thus, people at different stages of development are in principle, incapable of reasoning together. Of course, given an environment sufficiently rich to support increasingly effective rational procedures, the normal process of assimilation and accomodation yields full rational functioning in mature individuals.

Piaget's work transcends an analysis of reason in terms of logical and ontological categories alone. Piaget sees reason as constituted by a series of schemata through which experience is had. Such a sequence of schemata are evidenced in each individual's life history and in the development of culture over time. Piaget offers an evolutionary analysis that sees the schemata of rational understanding extended beyond biological development into the domain of organic and cultural evolution (Rotman, 1977). Such an evolutionary perspective identifies reason

within the context of social and cultural practices.

The analysis of reason in terms of the context within which reasoning occurs constitutes theories of reason of the third kind. On the third view, reason is what is expressed in paradigmatic social and cultural behaviors. Behaviors that can be seen as exemplifying reason are characteristic of almost all groups of human beings and expressed in their patterns of discourse: the methods employed for making and assessing empirical and theoretic judgments as well as judgments of value. Rational behavior, although functionally similar in all settings, differs greatly in its manifestations, reflecting the social and cultural reality within which judgments are made and assessed. Such a contextualist analysis of reason, whether based on language games, the community, or standards drawn from the special disciplines, requires that norms as actually employed play a constitutive role in determining the content of reason. This view can lead to relativism in the strongest sense. Since different milieus, each constitutive of rationality, can manifest incompatible or even incommensurable practices, standards of judgments drawn from within one context may not be applicable to another.

Evolutionary models, however, can be construed so as to ameliorate the implicit relativism of contextualism through the addition of criteria for the replacement of frameworks constitutive of more adequate rational behavior. The replacement of frameworks with newer and more rational ones is central to the evolutionary character of non-relativistic contextualist positions. Rational faculties and their instantiation in better evolved cultural practices constitute the grounds for the belief in the increasing adequacy of rational processes as tools for achieving theoretical and practical goals. What is characteristic of contextualist analyses of reason is that the different historical epochs, or in more extreme views, the various disciplines or social practices, judge rationality in their own terms. Such views, whether pragmatist, Marxist, or sociological in character, share the anti-essentialist perspective that denies an *a prioristic* or encompassing transcendental core to reason. Because of the centrality of actual ideational structures in defining standards for rationality there are, seemingly, only two options. Either the most adequate frame, frequently identified with aspects of the theorist's culture, constitutes the best available standard or we are left with a characterization of the outcome of rational evolution that is metaphysical in principle, as in Pierce (1931), and negative in practice, as in Popper (1963). Reason is what reason does, and what it does, in the most extreme views within this paradigm, is as specific as the different cognitive practices during the

various eras or within various domains.

The contextualist theory of reason is represented in a variety of philosophical and psychological theories. The most important, for our purposes, are the perspectives associated with psychological research. These include radical behavioral views that mark rational functioning as observable conformity with social practices (Skinner, 1971), as well as the information theoretic approach most abstractly characterized by Fodor (1975) and exemplified in attempts to construct models of artificial intelligence (Gardner, 1987). Such approaches can be viewed philosophically with an evolutionary-theoretic view that sees the development of rationality within the cultural sequence of increasingly adequate scientific paradigms. Science based accounts of rationality are implicit in Kuhn (1962) and more explicit in Lakatos (1970). Conceptual growth is a function of the replacement of general theoretic frameworks by arguably superior programs for research. Non-relativism is reflected through scientific progressivism, although not all such theoristis share the metaphysical commitment to the convergence of scientific progress on some ultimately adequate set of true theories as does, for example, Pierce. The anti-essentialism of such views is inherent in the claim that frameworks, although at any point constitutive of rationality defined in terms of their methodological norms, can be criticized and replaced from the perspective of other, presumably more adequate, cultural constructions.

Contemporary Psychological Research and the Theory of Reason

Contemporary theories of rationality amalgamate aspects of the three seminal perspectives outlined above. Experimental psychological research has included an on-going exploration of reasoning. Continental philosophers, in particular Habermas, have taken the theory of reason as an indispensible core of social critique. We will first present an overview of recent psychological research, exposing a clear trend towards contextualism. In the next section we will present relevant aspects of Habermas' views as a framework for reevaluating the consequences of experimental research. The result of this reevaluation will then be applied to the issue of critical thinking and educational reform in the sections that follow.

The understanding of the basic rational functions characteristic of recent experimental psychology includes two main threads clearly related to the basic models of reason discussed earlier. The first studies cognitive achievement viewed against standards extrapolated from formal deductive logic. Similar work is based on norms generated from the mathematical theory of probability. The second responds to the more substantive notions of logic based on the ontological and mathematical

structures derived from the Kantian categories (Kant, 1787/1929). Among the most influential theorists of the second sort is Piaget.

Although Piaget radically alters Kant's analysis by seeing reason as articulated over time, the fundamental Kantian account of reason in terms of formal categories is retained (Rotman, 1977). Piaget, like Kant, construes categories as pervasive and constitutive of the procedures that they make possible. Categories are seen as transcendental, that is as logical presuppositions of the cognitive functions that they support, and completely general in respect of their application. They are, thus, universally exemplified where they apply at all, and are characterized by the necessity that reflects their presuppositional status. Kant's transcendental analysis of the categories of reason is retained in Piaget's account of the development of rational capacity through stages of maturation (Piaget, 1968).

Recent criticism of Piaget, consistent with the rejection of trancendentalism in philosophy of science (Feyerabend, 1970), points to the untenability of categories seen as transcendental structures (Carey, 1985). Although such criticisms are themselves liable to a critique that emphasizes the dialectical nature of Piaget's theory of category development (Kitchener, 1986), Carey's analysis strikes deeply at the Kantian heart of Piaget's theory. Moreover, her position, whether accurately reflecting Piaget or not, is supported by an enormous accumulation of experimental research. The analysis of reasoning in terms of underlying formal structures, typical of theories based on logical or ontological categories, has been gradually abandoned in the light of experimental evidence. Research in the last twenty years increasingly points to the relative unimportance of formal structures in the conceptualization of performance in reasoning tasks (Revlin and Mayer, 1978, Nisbett and Ross, 1980). Theories restricted to the analysis of reasoning tasks in terms of the structural apparatus applied have been judged inadequate to account for the success or failure of individuals performing such tasks. The emphasis in explaining how people reason has shifted to the analysis of how formal or structural elements function within the context of their applications. Such a shift in psychological accounts of reasoning ability is apparent from reviews of studies of deductive logic (Revlin and Mayer, 1978), inductive logic (Nisbett and Ross, 1980), quasi-mathematical operations like reciprocity, (Donaldson, 1978) and general problem-solving (Newell and Simon, 1972). Success and

failure in reasoning tasks seems more easily understood as a function of the complexity and familiarity of the subject matter used in test protocols, than through the postulation of a general underlying competence that reflects pervasive and univocal formal structures.

This trend in experimental research points to a new synthesis that rejects Piaget-like claims that account for varying competency in reasoning by postulating differences in fundamental logical processing. It rather exhibits a focus on the encoding of information, the construction of networks of related ideas that represent relationships between items, including the assignment of epistemic markers indicating centrality and reliability (Anderson, 1983; Minsky, 1975; Pylyshyn, 1984). On such a view, inference reflects the nature of the network. Although logical operations are required to utilize the information encoded, the key to understanding the inferences drawn is the mental construction, the interconnections and logical strength drawn from the representation. By analogy with computers, although basic logical operations are crucial to reasoning -- the mechanism must have the capacity to perform formal logic functions -- to understand the inferences made (the operations performed) one must articulate the substantive representation of data as structured by the program that organizes data and uses it in characteristic ways (Gardner, 1985).

A now-classic analysis that exemplifies this approach is the explanation of typical "errors" in probabilistic reasoning in terms of "judgmental heuristics" (Kahneman and Tversky, 1972). The most commonly used strategies employed by individuals in their ordinary estimations of likehood seem to violate the basic principle of probability theory, the "law of large numbers," that relates sample size as a crucial variable in determining the reliability of an inductive judgment. These strategies include the "availability heuristic" and the "representative heuristic." The availability heuristic reflects the tendency of reasoners to assume that available information is appropriate to the inductive judgment at hand; the representative heuristic warrants such information to be taken as representative of the domain from which it has been extrapolated. Since, in all likelihood, any available body of information drawn from common experience is a mere fragment of the total information required and too small to yield statistical significance, such heuristics violate the law of large numbers. Despite their inconsistency with principles of probability it has been argued that such rules of thumb

are "...not irrational or even nonrational. They probably produce vastly more correct or partially correct inferences than erroneous ones, and they do so with great speed and little effort" (Nisbett and Ross, 1980, p.18). Although, at first sight, such a statement may seem incongruous, it is crucial to the understanding of the analysis of human reasoning as a function of content models, reasoning seen in terms of the content about which reasoning is done, rather than in terms of formal logical principles.

Commonly used inductive strategies, although probabilistically inappropriate, are employed because they are useful to people reasoning in "real time". Their utility offers a key to understanding the cental role of content models in the theory of human rationality. The person relying on the judgmental heuristics is working from a mental model of the situation at hand, from an estimation of reality based on his constructions from prior and vivid experience. This model reflects causal and probabilistic assumptions that support the inferences based upon it. Since real time judgments do not afford the luxury of careful sampling and reflective theory construction, the model of the content brought to experience may be inadequate. Nevertheless, it enables the reasoner to apply to the situation assumptions about the relation of data to the context. Like scientific theories, the content model enables the reasoner to judge relevance, apply generalizations that support causal inferences and estimate reliability. Content models are more rational, that is more truthlike, to the extent that the image of the world they afford is accurate. The ideal limit of such models is, of course, scientifically warranted theories based on adequate samples and reflecting the incorporation of all relevant information. But whether such an image is based on careful scientific analysis or the hastily constructed theories developed *ad hoc* by individuals in the course of their ordinary affairs, its role in reasoning is the same. The model warrants inference by including assumptions about relative frequencies, embedded causal laws and the like. This role is not adequately captured by the formal logical structures employed in drawing inferences based on the model. The predicates employed in the model, the system of categories the model exemplifies, the generalizations included and the statistical assumptions made are necessary if reasoning based on the model is to be understood. Therefore, to evaluate rational inductive functioning one must include as essential, information content. An analysis limited to the formal rules governing information processing will not do.

A similar conclusion about deductive inference is supported by the analysis of available experimental evidence on syllogistic reasoning offered by Revlin and Mayer (1978). The most common syllogistic error identified in

experimental research is the illicit conversion of universal propositions. Similar errors include interpretating conditionals as equivalences and taking linear orderings to be symmetrical. Such errors are seen by these authors as exhibiting a "striking commonality...(an)... emphasis on how reasoners encode information" (*op. cit.*, p.21). Summarizing their analysis of recent research, the authors maintain that "...the same formal information may be represented in the reasoner's memory in qualitatively different ways and...different patterns of inference performance can be accounted for in terms of differences in underlying memory representations" (*op. cit.*, p. 22). The authors conclude, "These studies point to the role of the reasoner's expectancies and past experiences in selecting and organizing to-be-reasoned upon information" (*ibid*).

An analogous conclusion may be drawn from Carey's re-evaluation of Piaget's research of children's reasoning (Carey, 1980). Her criticism echoes earlier experimental interpretations (Donaldson, 1977) in pointing to the failure of children at Piagetian tasks as a function of contingencies of experimental design rather than to the unavailability of fundamental categories of rational processing. A similar interpretation of work on the development of higher order relations, ontological fields (semantic constraints of predication), response to inconsistencies, and the creation and comprehension of metaphors, leads to the conclusion that transition from stage to stage is not holistic, as the Piagetian position would require, but rather domain specific (Keil, 1984).

Carey's work, however, does more than synthesize increasingly significant experimental results. She reconceptualizes these results within the perspective in the philosophy of science that is most strongly anti-transcendentalist, that of Toulmin (1953) and Kuhn (1962). Carey first offers an analysis of Piaget's epistemological claims, distinguishing five interpretations of the "fundamental differences" between children's rational functioning and that of fully developed adults. Of these five, Carey concludes, children differ from many adults in not having available meta-cognitive awareness (including the language to express meta-concepts) and not having many "tools of wide application" like mathematical skills. She argues that the two crucial abilities, (1) representing and manipulating information and (2) having basic categorical knowledge (appearance/reality, causality and identity) are in fact common to both children and adults. She sums up in terms of the fifth category "...the most important source of variance is domain specific knowledge. Children know less than adults. Children are novices in almost every domain in which adults are experts" (*op. cit.*, p. 574). But such lack of expertise cannot yield the sort of categorical judgment available from a transcendentalist interpretation of stages: for the criteria for having knowledge are as complex as the areas of knowledge, and expertise, including the expert knowledge of strategies, in such a model, is a matter of degree.

The most crucial analytic insight, however, is found in the reason

behind her claim that children have the same basic categorical potential that adults do. Carey argues that the apparent inability of children to express particular, especially causal and physical, concepts, is their lack of a theoretic model within which such causal notions are to be housed. She reminds us of the historical development of similar concepts within scientific thought and analyzes this, not as the lack of a transcendental schematism, but through the unavailability of a contingently true set of propsitions relating well chosen fundamental principles to empirically adequate concepts within a theory. The Kantian roots of Piaget's position are the key to understanding the need for a reconceptualization of his classic experimental results. According to the contemporary analysis drawn from philosophy of science and mathematics, Kant was mistaken about the transcendental character of categories, because he misconstrued the stability of the foundational concepts in mathematics and physical sciences (Pap, 1953; Barker, 1964). Kant required a substantivity for mathematics and a necessity for physical science that is both unneccesary and misleading as an image of the structure and function of mathematics and science. Since Kant's requirements do not reflect actual properties of mathematics and science, the transcendental argument that accounts for their possibility is superfluous.

On such a contemporary account early scientists and, by analogy children, think as they do about the physical and quantitative phenomena they encounter because of the very different theories they hold and not because of different fundamental schemata that represent underlying formal logical structures. Carey concludes her summary: "Perhaps, too, children hold theories in some domains actually at variance with the adults" (*op. cit.*, p. 574). In a world of fairy tales and cartoons, is it any wonder that children are confused in their ontology and anthropomorphic in their beliefs?

The experimental results and theoretic analyses we have reviewed give clear empirical support to the wealth of social psychological studies indicating the context sensitivity of cognitive behavior, expressed in judgments ranging from the observational to the ethical (Asch, 1952; Milgram, 1974). They echo the study of racial stereotyping that finds perception, recall and estimations of correlation reflecting the mental models brought to the data (Hamilton, 1981). This research strongly reinforces the general perspective found within the political or sociological analysis of epistemology that questions the relevance of a simple formalist account of rational functioning. Such views, whether found in continental sociologists (Durkheim, 1953), or Anglo-Saxon psychiatrists (Laing and Esterson, 1964) take it as basic that judgments of rationality are normative and relative to the social and political standards that constitute being deemed a functioning member of society. That is, to be rational is more aptly seen as having mastered procedures

and internalized standards of information processing and judgment rather than as having some underlying ability that is general in respect of the content to which it is applied.

As mentioned earlier, the third basic model of reason may include an evolutionary image of rational development that permits an anti-relativism quite consistent with cultural or even individual development. Such a model seems clearly applicable to technical and theoretical progress, the sense of maturing scientific awareness, including the increasingly adequate epistemological understanding extrapolated from successful scientific practice. But as Habermas (1971) has argued, such understanding is not sufficient for a general theory of rationality, since rationality includes practical reason.

Kohlberg's Theory of Moral Reasoning

Kohlberg's theory of moral development (Kohlberg, 1976) is an evolutionary theory of practical reason that identifies a developmental sequence of stages of moral reasoning. Stages are defined, as in Piaget, in terms of underlying formal schemata. That is, each stage is characterized by logical operations necessary to account for the forms of argument available to the individuals at that stage, independent of the substance of the arguments put foward. The claim is that at each stage individuals are able to support moral judgments with arguments that are more adequate than those available at earlier stages (Kohlberg, 1971). Although the bulk of the research associated with his theory has centered on issues of individual moral development, Kohlberg sees his theory as broadly historical, supporting an anthropological and evolutionary thesis that sees stage development within changing cultural patterns of moral thought (Kohlberg, 1977). Kohlberg takes from Piaget the view that higher stages of reasoning are more adequate to reality, in the sense of the objective realm to which reasoning is applied and to which activities are directed (Kitchener, 1986). Such a claim, however, creates difficulties since moral claims are not as readily grounded in some objective domain as are scientific or technical ones. What is required then is a standard for moral adequacy.

Kohlberg offers two basic criteria in support of the meta-ethical norms that reflect his position as to the increasing adequacy of moral judgments. The first is that each succeeding stage is logically more

adequate, in the sense that it resolves moral dilemmas unresolvable at earlier stages (Kohlberg, 1976). The second is that the sequence of developmental stages reflects an advance in philosophical adequacy as gauged by the history of ethical and metaethical thought. For Kohlberg, the most adequate philosophical ethics is that of Kant, whose work he sees epitomized Rawls' *A Theory of Justice* (1971).

It is hard to accept the justification of the second, historical, claim. The utilitarians, for example, were quite conscious of Kant, as are contemporary teleologists. Moreover, deontological perspectives are not uncontroversial in philosophical thought. Not only are substantive categorical principles hard to come by, but they frequently underdetermine their application to cases. Particular acts can invariably be viewed under a number of competing principles leading to mutually incompatible moral judgments. The historical and philosophical record does not clearly support Kohlberg's claim; neither does the facts of moral practice. Teleological concepts of moral judgment are employed in social and political contexts at the most sophisticated levels of rational deliberation; rights or rules perspectives are frequently overridden when the results to social stability or the good of groups in society are seriously threatened. Problems that result from the conflict of rights and utility have exercised moral theorists throughout the history of moral and political thought. Kohlberg cannot claim a clear trend, nor can he assert the priority of deontological conceptions without entering into a longstanding philosophical dispute. The ongoing debate in philosophical ethics is a reminder that his claim for a clear Kantian tendency in contemporary thought is even less defensible. Certainly there was a time, following the consolidation of Rawls thought in *A Theory of Justice*, that neo-Kantianism in Rawls' sense was at the center of much of the work in moral theory. But that is no longer the case. Rawls' work no longer constitutes the dominant paradigm in contemporary philsophical ethics. Recent interest in the virtues and their relation to social, cultural and historical realities (MacIntyre, 1981), as well as the discussions of problems and conflicts within the sorts of overarching conceptions of moral justification that Kohlberg espouses (Williams, 1981) point to a deeper and more complex analysis of moral reasoning than Kohlberg's version of Rawls affords. The issue, of course, is not whether these alternatives will be ultimately found more adequate. Rather it is that the very existence of responsible professional discussions that are non-Rawlsian, blocks Kohlberg's claim to the unanimity of mature philosophical thought (Reed and Hanna, 1982).

What of the first and more substantive criteria Kohlberg offers in support of his claim to the greater adequacy of succeeding stages of moral reasoning? The claim is that higher stages are more logically adequate as schema that underly moral reasoning in a sense that is analogous to Piaget's standard for the stages of non-moral reasoning. Kohlberg takes from Piaget the central claim that higher stages are more adequate as rational tools of accommodation; the agent using a higher stage of reasoning is more capable

of organizing experience, better able to include the range of available information in a coherant system of thought. Piaget's standard of accommodation is defensible as applied to schemata that organize empirical data, for in scientific and technical domains, criteria for successful accommodation are relatively non-controversial. Standards such as the cogency of predications and the breadth and depth of theoretic explanation are available as an index against which the conceptual adequacy of scientific thinking can be measured. Standards of analogous stability are, however, unavailable in the domain of moral judgment. There is no accepted theory of the truth of moral claims, nor is there a clear standard for pragmatic success applicable to moral evaluations that is analogous to standards of scientific acceptibiltiy.

Kohlberg's surrogates in the moral realm for standards of empirical or theoretic adequacy are various. They include substantive moral principles (respect for human life and dignity), formal principles (reciprocity) and procedural considerations (the systematic taking of each involved party's perspective by all engaged in moral judgment: "moral musical chairs") (Kohlberg, 1981). But none of these yields an adequate counterpart for the key feature of empirically and scientifically adequate judgments: conformity to a reality that is relatively objective and independent of the judgments assessed. To accomommodate the need for an analogue to the scientific notion of conformity to reality, Kohlberg makes an unsurprising, but dubious move. He takes as the crucial indicator of moral adequacy the unanimity of moral judgment found in individuals at the highest stage of moral reasoning. In a characteristic passage, Kohlberg states, "Thus, at Stage 6, the criteria of consistency and reversiblity are fully met, because one and only one resolution would be accepted as fair by all concerned" (Kohlberg and Elfenbein, 1975, p. 281). Elsewhere, in reporting an empirical study of Stage 6 graduate students in Philosophy, he states, "As we expected, on the dilemmas used all the Stage 6 subjects agreed in the content of the principles chosen, as well as in the form of reasoning, and the content chosen was equity" (Kohlberg, 1978, p. 212). Kohlberg summarizes: "(A principle)...must be general: it must order all the relevant decisions, or it will lead to inconsistency and conflict" (*ibid*, p. 220); and "Insofar as, in fact, decisions can be made by substantive principles, the resulting decisions are more fully determined and in that sense more equilibriated" (*ibid*, p. 221). The unanimity of moral judgments temporarily disapperared as researchers in moral development found it increasingly difficult to score actual samples of moral reasoning at Stage 6 (Kohlberg, et. al. 1983), but in the most recent offerings we find, "Unlike a Stage 5 reliance upon notions of prior social agreement to resolve dilemmas, the equal respect principle and the moral point of view of Stage 6 constructs anew each case or dilemma in an effort to reach ideal consensus." (Kohlberg, et. al., 1985, p. 25). Earlier in the discussion Kohlberg states, as the goal of Stage 6, "the seeking of consensus through dialogue" (*ibid.*, p. 2). But consensus is not unanimity, and there is no guarantee that the upshot of dialogue will be agreement. Nor does agreement in principles entail agreement in judgment, since the application of principles to situations is not automatic, nor is it univocal.

Convergence in judgment does not follow from the uniform following of procedure. neither do claims to an objective grounding in some independent reality follow from the univocality of individuals participating in a socially constituted process. Science, no matter how anti-realist relies on the availability of a domain of empirical test (van Fraassen, 1980). It remains to be shown that there is some correlative domain that furnishes an objective ground from which the adequacy of univocal moral judgments can be derived.

We may rightly ask: Why should convergence of moral judgment be a criterion for adequacy? It is a truism of social science that conformity in judgment and belief is readily explained through social psychological forces. But there is more to the issue, for the claim that univocality of moral judgment is desirable is open to challenge. The history of moral judgment, both normative and meta-ethical, has exhibited a context sensitivity, both to aspects of the situation and to the norms applied, that has precluded agreement among careful moral thinkers. This is not surprising, since the multiplicity of goods sought, as well as the determination of rights and duties, create conflicts that are not easily resolved. The richness and diversity of moral judgment is evident, both from the discussions of philosophers and in the substantive development of moral institutions. For example, the decisions of the United States Supreme Court, both within conflicting judicial opinions and during various eras display various principled criteria, all within the context of moral and legal disputation at the highest levels of sophistication (Rieke, 1986). Such an interplay of the judgment types frequently includes rules of procedure; as frequently, principles chosen reflect large scale social forces and a sense of the common good; recent concern is with the good of identifiable groups and traditionally, concern with the well functioning of institutions. Kohlberg cannot assume, as he does in his discussion of judicial arguments for the death penalty (Kohlberg and Elfenbein, 1975), that his judgment of the superiority of de-ontological reasoning is *ipso facto* evidence for its greater adequacy as legal argumentation. It is one thing to invoke principled reasoning, as defined by structural or procedural properties, but it is another to maintain the superiority of one of the various available high order principles (the sanctity of life, in the case Kohlberg discusses) as the most adequate *vis-a-vis* alternatives (the stability of social norms and institutions or the demands of particular sub-groups of society). Short of a careful philosophical argument -- and none presented has resulted in agreement among philosophers -- there is no reason to expect agreement in the substance of practical issues.

Given the complexity and the context sensitivity of moral judgment, it is highly unlikely that any clear hierarchy of principles or judgments can be supported. But there is an alternative, the alternative that Kohlberg confuses with his normative stance: the development of principled procedures to which all parties in the dispute are committed and which they support. Such procedures require the establishment of institutions to adjudicate disputes and develop compromises enforced by the institution

and accepted by all participating parties. A commitment to procedure does not, of course, entail that the judgments that result are correct in some metaphysical sense, but rather that social institutions that generate and enforce the acceptance of procedurally correct decisions be established and sustained. The rationality of such institutions is a function of the quality of the arguments that such decisions reflect. And so the theory of practical reason requires a theory of moral argumentation. A theory of moral argumentation may include *a priori* or even empirically identified transcendental normative and logical principles, but it is not exhausted by such. Rather, what is required, is an elaborate account as to how such principles interact within the course of argument to sustain supportable judgments, and how these judgments can be criticized and reevaluated in the light of future developments and new contexts.

The summary and reevaluation of the Kantian aspect of Piaget's work, as evidenced in the studies of deductive and inductive reasoning cited, in research on the development of categories of ontological understanding in children and in the theory moral reasoning, all converge on the same conclusion. The Kantian notion of reason based on transcendental schemata has not found support in the research program that was initiated in its name. Rather, the direction of psychological research points to an anti-essentialist perspective in which deviations from logical norms are to be seen in terms of the particulars of the context within which information is organized. Inference is as much a function of prior semantic and pragmatic attitudes towards the categories applied to the information encoded, as it is of the formal principles that govern the manipulation of the information so structured. Similarly, the analysis of practical reason points to the centrality of contextual and substantive issues rather than to formal and structural aspects and to the theory of argument as the locus within which practical reasoning is to be understood. In terms of the analytic model presented above, the research program that attempted to explore the second logic based model for the understanding of reason resulted in clear evidence for the adequacy of the third model. Logical procedures as evidenced by reasoning behavior point to the contextual nature of reason. Thus, rational behavior cannot be assessed by logical norms alone, but must take into account the cognitive context, reflecting personal and social variables, of the task assessed. How can this result be reconciled with the intuition that the assessment of reasoning is objective? How can reasoning be available for the criticism of the social and cultural context within which reasoning behavior takes place? And most importantly given our concerns: to what extent do these new insights affect the ideal of the development of human reason within education? It is to these issues that we now turn.

Habermas, Education and Technical Reason

A key to the articulation of a theory adequate to reconcile the contextualist and objectivist intuitions that lie behind an analysis of reason is included in the work of Habermas (1971, 1979, 1981). As we shall see, the theory of human communication formulated in these works offers insight

into the possibility, and the difficulty, of taking the development of critical reason as a goal of education. In *Knowledge and Human Interests* (1971) Habermas introduces the project upon which the remainder of his work is based: to support the thesis that "The only knowledge that can truly orient action is knowledge that frees itself from mere human interests and is based on Ideas..."(*ibid*.., p. 301). This project requires an analysis of human reason that transcends theoretic reason as exemplified for Habermas by Pierce's theory of scientific knowledge and interpretive reason as represented by the hermeneutics of Dilthey. The critique of these views is based on a concatenation of Freudian perspectives with neo-Marxist and sociological critique. Freud's notion of the repressed is accommodated to a socio-political analysis of concepts and concept use. Habermas amalgamates Fichte's (1845/1962) analysis of dialectical reason with Kant's (1792/1959) view of practical reason as serving its own interest. He claims that such an amalgamation frees rational criticism from the technocentric limitations and circularity inherent, respectively, in pragmatism and hermeneutics.

Rational criticism is seen by Habermas as bringing socially repressed cognitive elements to consciousness. Most crucially, "principles of validation," criteria in light of which judgments are made, are made explicit and subjected to criticism (Habermas, 1979, 1981). This process leaves reason open to itself: an inherently emancipatory activity that combines theoretical and historical understanding for the purposes of rational reflection (Habermas, 1971, 1979). Habermas' conception of reason as open to itself constitutes a return to the Platonic notion of the self transparency of reason (Habermas, 1971, appendix). This return to the notion of reason as fundamental and as being uncovered rather than constructed, the first of the basic theories of reason outlined above, is crucial for the interpretation of the experimental research presented above. For by distinguishing reason from the logical procedures that have been seen as context sensitive, reason can transcend the psychological and social structures that account for its relativity. Objective and universal reason is possible when it is seen as the foundation, and as the outcome, of the social process that brings inherent rational capacities into the open. Reason is seen as a general and definable procedure that brings to awareness and for criticism particular principles of validation, but which presupposes the availability of fundamental logical and epistemological concepts required for the task of criticism itself.

Rational criticism frees reason for itself. The theoretical task is to uncover methods through which such transparency can be made possible. The demand for an analysis of procedures that emancipate reason from biasing interests motivates much of Habermas' later work. His analysis reflects consequences for a model of the social structuring of rational abilities. Such consequences can be applied to our goal of understanding the adequacy of critical thinking as an educational ideal, education that following Siegel (1988) sees students as rational agents.

Habermas' later work grows out of the analysis and rejection of technical and hermeneutic models of reason offered in *Knowledge and*

Human Interest. This seminal work presents an analytic context necessary for the development of the theory of universal pragmatics that underlies the analysis of critical reason (Habermas, 1981). Of particular salience, given our interest in the consequences of current theories of reason for educational practice, is the affinity of this account to the tradition of progressive education (Dewey, 1933), and indeed, philosophic education in the Socratic sense. As mentioned earlier, contemporary educational theorists, Paul and Lipman most prominently, have called for reform in the name of critical thinking. Siegel (1988) argues that the development of critical rationality in students is an educational obligation in response to a most basic human right. More conservative educators like Glaser (1985) see the development of rational thought as crucial to accomplish much more centrist educational and social objectives. Habermas' views, however, cut deeper. The depth of his analysis of reason, and his identification of critique with Fichte's analysis of dialectical reasoning in terms of Kant's notion of moral reasoning, places critical reason at the deepest levels of personhood. Habermas derives the notion of critical reason from the Kantian metaphor of the "kingdom of ends" (Kant, 1785/1959). Critical reason is the activity of the person in the fullest sense; it is the tool that frees the individual from the contingencies of interest and from the limits of technical or ideological presuppositions. Education in such a view is, as in Plato, most fundamentally moral education; it is "education for the soul" (Cornford, 1962).

Education in the name of critical reason requires that reason be "for itself," that reason serve its own interest. This interest, identified with critique, is seen as the thematization of any aspect of the validating process: the availability, in principle, of all concepts, and especially framework concepts, to open and critical reflection. This procedure, viewed pragmatically, is essentially interactive, dependent on a social structure that supports such interaction through a community dedicated to critique as its essential concern. The development of Habermas' theory offers an articulation of this view. Of special interest to us is the theory of "universal pragmatics" that he sketches as the preliminary framework for a theoretic understanding of the structure within which critical rational process is to be defined.

Habermas' analysis of "universal pragmatics" begins with speech acts seen from the perspective of their validation within a community of interlocutors engaged in dialogical practice and through a framework of normatively structured responses (Habermas, 1981). Speakers in dialogue bring to the discussion a commitment to the practice of critical inquiry. Included in this practice are procedural expectations that permit claims to be challenged and require responses to such challenges consistent with the logical, epistemological and evaluative norms deemed relevant to the subject at hand. Such norms reflect the priority of the central concepts of validation: truth, value approriateness and context situatedness (sensitivity to the aims, worldviews and social reality of the participants). Universal pragmatics draws heavily from speech act theory (Austin, 1962; Grice,

1957; Searle, 1970), and foundational work in the theory of informal logic (Toulmin, 1958). The theory of universal pragmatics, however, is not merely a technical articulation of dialogical process. Habermas' work is enriched by the breadth of his philosophical and sociological interests, by his careful study of the continental tradition of philosophical critique, and by the work of developmental psychologists. These give him the general framework within which univers l pragmatics is to be set and establish the context for the claims of critical reason (Habermas, 1971). Developmental theory gives him an image of the social and personal maturation of all aspects of rational process necessary for full participation in a dialogical community (Habermas, 1981, chapter 2).

Despite his close study of developmentalism, Habermas rejects its transcendental aspect. "The expression transcendental, with which we associate a contrast to empirical science, is thus unsuited to characterizing, without misunderstanding, a line of research such as universal pragmatics" (Habermas, 1981, p. 25). Habermas follows Kohlberg in identifying stages in rational competence. These, however, are not logical schemata, transcendental structures in the Kantian sense, but rather stages of psycho-social development that moderate the ability to engage in communicative speech acts ("What is Universal Pragmatics," in Habermas, 1981).

Kohlberg, whose work Habermas cites, is aware of the tension between their views. In his systematic reply to criticism (Kohlberg, 1984), he sees Habermas as articulating stages of "interactive competence" analagous to Selman's stage theory of social perspective taking (Selman, 1980). Kohlberg asserts: "...we understand them as necessary but not sufficient to define the structure of moral stages." (Kohlberg, et. al., 1984, p. 384) What is missing for Kohlberg? The logical apparatus that supports higher order moral judgments. These are "structured wholes...general adaptional functions of cognitive structures (that are) always the same." (ibid., p. 14). Kohlberg follows Piaget in taking stages as universal cognitive structures, transcendentally necessary as the ground for the possibility of reason. It is just this transcendental necessity that Habermas denies. For reason is given as pure idea, to be uncovered in the process of dialectical exchange (Habermas, 1971, appendix). Habermas' universalism is Platonic rather then Kantian. It is not based on logical or ontological categories, it is rather a given. Reason must disclose itself through dialogue. There are presuppositions for engaging in dialogue, as there are in Plato, the stages that reflect the level of communicative action. These, however, are interactive and social, contingent exigencies of intellectual maturation, social organization, and the possibility of dialectical interchange.

To review where we now stand: Habermas, a critical theorist working from a contextualist perspective, sees reason as deeply embedded in human interest. His view, although independent of the empirical research cited above is consistent with it. This contextual nature of reasoning prompts him to develop an alternative account to support the possibility of social critique. He returns to the first of our analytic models of reason, reason as primordial.

Using a psychoanalytic metaphor for social awareness in conjunction with neo-Marxist social critique, Habermas sees reason as covered by layers of social interest. He then defines a "therapeutic" process that permits biasing interest to be challenged and the underlying reason exposed. Habermas, like Plato and Freud, gives no account of the details of reason. He does not follow the second model for theories of reason offered above; unlike Aristotle, Kant and Piaget he offers no account of the formal logical and ontological categories that reason uses. Reason is manifested, no matter how unclearly, in the process of communicative action. The role of dialogue in Habermas, education in Plato and psychoanalysis in Freud have a deep affinity. They are procedures, within a personal and social context, whose structure permits the systematic identification, critique and replacement of anti-rational elements. The critique is ongoing, perhaps endless. Irrationality is exposed. Reason is presupposed.

Habermas' theory has important consequences for critical thinking as the locus of educational reform. Without the transcendental core of logical and ontological categories, cognitive development is contingent and there is no reason to assume that it is either uniform or monolithic in the sense relevant to our concern with students as actual or possible rational agents. The contingency of rational capacity is crucial for the educational reform that students' status as rational agents might entail. Freed from the constraints of developmental restrictions on rationality in the immature, educating for critical reason becomes a theoretic possibility. As we shall see, although admitting the possibility of education for reason, the theory of reason that Habermas offers requires a context for critical rationality that raises serious problems of theoretic and practical concern. What is most telling, in this regard, is his portrayal of the limitations of technical reason (Haberman, 1971), for the educational practices most common in the schools reflect, to an extreme, the narrow and unreflective nature of reason in the technical sense (Goodlad, 1984).

Technical reason is, for Habermas, the application of thought to problems. It defines the problems to be solved and determines the availability of putative solutions. Characteristically, technical reason limits the extent to which criticism is appropriate. Unreflective as to its underlying principles, technical reason requires conformity to established practice and validates reasoning in terms of norms prior to and external to the problem at hand. Habermas derives the notion of technical reason from the understanding of the structure for validation in science offered by Pierce (1931). In science, Habermas maintains, validation is essentially monological,

> "...the symbolic representation of matters of fact knowable from the transcendental perspective of possible technical control serves exclusively for the transformation of expressions in processes of reasoning. Deduction, induction and abduction establish relations between statements that are in principle monologic." (Habermas, 1971, p. 137).

A monological validation is limited to the principles underlying the inquiry to which it is applied. Norms that are applied constitute the boundary conditions of the inquiry. Inquiry is seen within the context of such norms; the norms themselves stand outside of inquiry, immune to thematization and critique.

Such a view is at the core of positivist and neo-positivist philosophy of science. Popper's notion of the "third world" and the classic distinction between the logic of discovery and the logic of justification, reflect the pervasiveness of this idea. But even in a richer, more dialogical image of science, such as Kuhn's (1962), monological practices perisit in "normal science," science done through a paradigm taken as a normative procedure governing work within its domain. Paradigms, recall, consist in a body of accepted research procedures derived from an exemplar of scientific research. The paradigm is taken as a model and is employed to select and solve problems structured in accordance with the research that stands at its core. New research leads to an extension of the central image in both detail and scope, and includes improved experiments and observation strategies consistent with the fundamental research model. Paradigms include a technology of instruments, areas of typical applications and social structures needed to support scientific activity, especially the training of people in the paradigm (Kuhn, 1962, chapter 5, pp. 47ff.)

Education, no doubt for excellent reasons resembles nothing more than a caricature of normal science. As in McPeck's (1981) approving view: "The elementary schools are fully occupied with their efforts to impart the three Rs, together with the most elementary information about the world around them" (p. 16). Education, like normal science, initiates students into practices whose fundamental structure and content is taken as given. Students are judged, as are scientists working within a period of normal science, in terms of their mastery of paradigmatic procedures and, at best, in response to their ability to extend such procedures in novel and imaginative ways. Creativity is rewarded when its results demonstrate the adequacy of school learning; intelligence and rationality are evidenced by the level at which standard problems are addressed; superiority is proved by the solution of recalcitrant puzzles defined within the paradigm with solutions restricted to approved procedures. In fairness, we must recall that the elementary information to which McPeck alludes is rich and socially essential. It includes facts of science, deeply entrenched views of reality, fundamental procedures, images of society and history, the understanding of civics, and standard and approved interpretations of literature, music and art. But we must also recall with Goodlad (1984) and the chorus of agreement reflected in reports, journals, conferences and programs of educational redesign, that these are, for the most part, facts forgotten, reality unrevealed, procedures that remain mysterious rituals inadequately performed, oversimplifications and stereotypes, self serving political distortions and the relatively uninformed opinions of undertrained, frequently unqualified and socially maligned teachers.

Educational Reform and Critical Thinking

Given our analysis of recent trends in experimental psychology and our critique of Kohlberg's theory of moral reasoning, it would seem that contextual considerations weigh heavily on the manifestation of rational behavior. Our broad survey points away from the adequacy of a logical, *a priori* or transcendental analysis of reason, indicating, rather, the need for a more detailed empirical and conceptual account. The universalism of Habermas is consistent with this view. The possibility of critical reason is not based on the autonomy of logical thought. Rather it reflects a process of dialogue within which biasing interests can be unremittingly identified and assessed. The centrality of context in the analysis of reason presents a challenge for proponents of critical thinking as an instrument of educational reform. For if judgments of the adequacy of reasoning essentially involve substantive norms drawn from the subject matter reasoned about, how are we to distinguish rational critique from the objectification of the interest of those in whom the responsibility for content instruction is placed? Dewey's notion of the community of inquiry as elaborated by Lipman (Lipman, et. al., 1980), or the Socratic notion of open criticism based on the model of the self-effacing teacher whose only passion is the rational passion required by Paul (1986) have been offered as solutions to the challenge. Both, however, fly in the face of the inherent inequality of the members of the school community and the divergent interests that members of that community bring to the classrooms.

The educational community reflects underlying realities of class and political affiliation, as well as the powerful perspectives that constitute professional groups and competing factions within bureaucracies. Because of age, relative ignorance, and the social power of educational evaluation the student is vulnerable to all of these. Such liabilities extend throughout the educational system, whether as the class prejudice of elementary school teachers or the substantive political positions of university professors. And such liabilities affect the student deeply, for they are part and parcel of the social structure that determines the assessment of students' rational competence. The contextualist account of reason implies that the rationality of students can only be seen within the framework of what constitutes "good reasons" as expressed within the context of judgment that the teacher and school espouse. The challenge for the critical thinking movement is to address the enormous potential for abuse that the absence of clearly relevant formal standards permits. For without standards that are specifiably independent of context, judgments of the adequacy of reasoning are dependent on substantive norms drawn from the content reasoned about. Contextual norms, including most of the informal fallacies, cannot be applied without some measure of competence in the domain to which they are to be applied. Who is a legitimate authority? What constitutes logically pernicious vagueness? Which causal claims are warranted by well established scientific theories? Such determinations are impossible without a rich and adequate

model of the domain to which such judgments apply. More generally, the elaboration of warrants and grounds requires understanding of the underlying claims, substantive and methodological theories from which support is derived (Toulmin, 1958). Students, ignorant of content and subject to assessments that strongly affect their future well being, have little recourse other than to accept the authority of teachers and texts. The hierarchical structure of education affords a presumption of expertise that few students can reasonably challenge. With formal and topic neutral standards, critical rationality would be, in principle, available independent of special knowledge and skill. But without such content-neutral standards, with critical thinking embedded in the substantive domains that define the norms of validation, the student must bow to the judgment of her betters. If norms are content based and if reason requires the utilization of such norms in context, the student has no recourse in areas of ignorance to see as appropriate the application and assessment of norms presented to her by her mentors. The teacher is the repository of special knowledge, reason in context requires the appropriate application of the norms. Thus, the student must defer to the teacher *for to do less would be irrational.*

The analysis of critical reason offered by Habermas stands in contrast to the image of education offered above. For reason, on his account, is not the mere utilization of content based norms. That is limited reason, "technical reason." Reason in the fullest sense, "critical reason" is the identification and criticism of norms. Reason requires a universal pragmatics, a process through which norms are brought foward and subjected to rational critique. The contrasting image that Habermas affords offers a key to resolving the dilemma for critical thinking education that the contextualist account of reason generates. Reason for Habermas is contextual; critical reason does not require the absence of context. Rather it demands that any element of the context be available for critical discussion. The demand for a context within which critical thinking is to occur does, however, raise a preliminary issue. The exploration of content entails that critical thinking be related to context. If such discussion is to be meaningful to the participants the focus of the discussion must be of significance to the participants. Content must reflect the issues of interest that constitute the lived reality of the discussants (Habermas, 1971, chapter 3). The content chosen for critical discussion must satisfy an additional constraint as well. As McPeck (1981) has emphasized, critical discussions must be based on adequate understanding of the topic under discussion. This is certainly consistent with the view elaborated here, for rationality in context is dependent on the adequate utilization of the norms of validation appropriate to the object of critical inquiry, although, on Habermas' view such norms are not immune from revision in the light of ongoing discussion. The centrality of norms of validation in critical discussions requires that the topics discussed are comprehensible to all parties involved.

A seemingly obvious way to meet the demands of meaningfulness and comprehensibility is to use students' experience in schools as a primary focus of critical discussion (Lipman, et. al., 1980, chapter 1). Schooling

recommends itself for deeper reasons as well, reasons that reflect the underlying need that motivates Habermas. As outlined above, school affects students profoundly. For students, school constitutes the analogue to the context of labor central to Habermas' neo-Marxist concerns (Habermas, 1971). More importantly, school is a primary locus of evaluation. The judgments applied to students constitute a significant indicator of their worth as rational agents, and as such are crucial to the concept of education common to critical thinking advocates and to Habermas' concern with the moralization of Marx's insight. Reflection on education, therefore, should be the primary focus of critical thinking in the schools. What is required is that the concepts and social structures underlying schooling be made available to students for critical inquiry. For young students this need not require that sophisticated educational theories be presented. Rather, the teacher and the school must stand willing to meet demands for clarification as they are reflected in students' growing awareness. Time for critical reflection and a social milieu that supports critique are enough to begin the process.

The next step requires that students be empowered with the most fundamental norms of validation, principles of logic and analysis. As they advance into the special disciplines fundamental methodological and epistemological standards must be exposed and explored (Weinstein, 1985). In the arts, principles of criticism must be included along with the usual exemplars of culturally valued art works. As education moves into professional training, the interests served through students' initiation into technical expertise replaces the initial exploration of schooling as the focus of critical concern. The nexus of social and political history within which schooling takes place is another area to which critical thinking in the schools may be applied. Similarly, the embedding of schooling in social structures that reflect deep and pervasive values must be made available to critique. The family, sex roles and class structures are manifestations of such underlying values; they too are appropriate as topics for critical thinking. But whatever the object of critical inquiry, openness and a commitment to rational validation is fundamental.

Even as summary an outline as that offered above presents a clear challenge to educational reformers who strive to address the analysis of reason presented. Reform requires an openness that is barely conceivable in education as it is now constituted. Nevertheless, attempts in this direction have already been made. Lipman's program, Philosophy for Children, is one such attempt (Lipman, et. al., 1980). Philosophy for Children attempts to construct an arena within schooling that mirrors open and critical inquiry (Weinstein, 1986). By placing critical dialogue outside of the standard concerns of schooling, Lipman hopes to bypass the technical interest that characterizes most of education. As straight-forward a device as the prohibition of grading within critical thinking instruction, frees students engaged in the program from the most overt and onerous control mechanisms through which the schools advance the technical interest. Centered on the life experiences of children in the family and in schools, Philosophy for Children presents topics for critical inquiry that require a

minimum of special expertise. In that way the presumption of the teacher's superiority in matters of content is minimized. Topics for discussion are presented through models of dialogue. The dialogue includes overt appeals to logical and analytical norms. In that way children are introduced to logic as a tool for inquiry. Lipman's work shows that critical inquiry is possible in the schools. How inquiry can be extended to encompass a wider range of student concerns remains a crucial issue. Paul and his colleagues have initiated such a program, presenting models of curriculum redesign applied to standard school subjects (Paul, et. al., 1986). Without Philosophy for Children's history of successful school adoptions it is still unclear whether the entrenchment of school subjects within a technical perspective will render such critical inquiry impossible. Whether it will be possible to infuse significant critical thinking into subject matters whose mastery has traditionally required the adoption of disciplinary norms still remains an open question.

Conclusion

The complexity of the empirical issues, and the lack of stability and unanimity in the paradigms governing the study of human beings, their rational development and their competencies, points to the need for careful conceptual monitoring of the application of the tentative results of cognitive theory. But this should not be seen as support for conservatism. Because of the very enormity of the responsibility we have to educate our children, the educational establishment tends to limit itself, disregarding alternatives to apparently successful theories in the name of prudence. The general acceptance of developmentalism by educators is an instance of such narrowness. Professional conformity in the name of available research is, however, extremely dangerous. For if seeing some success in theory or practice, we retrench, taking comfort in whatever constructions define our facts, structure our experiences and observations, and generate the social instruments for the perpetuation of our views, critical evaluation of current paradigms becomes impossible. The impossibility of progressive reform follows as a matter of course.

The complexity of the logical and epistemological issues requires that the greatest care be taken to distinguish justifiable principles of substance from prejudices that become constitutive of group practice. How this to be done is at the center of applied philosophy in the broadest sense. It is an essential element of the attempt to isolate the epistemological from the sociological in the theory of science, it is crucial in addressing medical and legal practice within an ethical perspective and it is at the core of central issues in informal logic, in

fallacy theory and the identification of acceptable premisses. How this can be done in education must be at the center of the task of educational reform as well. The best available corrective is rational critique and so transcendental structures, and the reification of theory in institutional practice becomes the greatest danger. The challenge of these tasks must be faced, for as we have seen, such issues are embedded in the articulation of the notion of human reason, and as such are not merely an empirical matter. For the notion of reason is at the heart of the deepest self-indentification of human beings, and especially so within the greatest philosophical traditions that constitute our moral sense. We have a responsibility to educate in the name of those traditions.

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